Chapter XX

Scholarly Communication in AERA Journals, 1931 to 2014

Raf Vanderstraeten
Ghent University and University of Chicago

Frédéric Vandermoere
Antwerp University

Maarten Hermans
Leuven University

Scientific disciplines build on social structures, such as scholarly associations and scholarly journals, that facilitate the formation of communities of specialists. Analyses of such social structures can thus also be used to shed light on the morphogenesis of scientific specializations. The authors analyze how two journals of the American Educational Research Association, the Review of Educational Research *and the* American Educational Research Journal*, organized communication around education in the period between 1931 and 2014. The authors focus on three interrelated aspects: (a) the changing structures of authority and authorship, (b) the national-versus-global orientation of these journals and of the association, and (c) the features of the citation networks of both journals and the ties between education research and other fields of research, especially psychology and sociology. The authors' analyses of these interrelated aspects of the communication process enable them to provide an outline of the morphology of the community of education researchers and to raise reflectivity about the social conditions that control education research.*

The 19th- and 20th-century rise of disciplinary specializations within the field of science depended on two kinds of social structures. The level of structural support for scientific research increased markedly after the expansion and reformation of the university system, which was first realized in Germany (in the so-called

Review of Research in Education
Month 201X, Vol. XX, pp. 1–24
DOI: 10.3102/0091732X16678836

Bildungsuniversität) but quickly spread to other countries. New occupational roles in universities increased the time available for scientific research, and scholars became able to make careers in research. But the rise of scientific specializations also depended on the formation of specialized scientific communities—networks of individual specialists. Such communities built (and still build) on social structures that enable the intensification of interaction, the development of shared expertise, the articulation of conventionalized problems and approaches, and so on (see Abbott, 2001; Hoskin, 1993; Jacobs, 2013; Oleson & Voss, 1979; Turner, 1980).

Seen in this light, scholarly associations may play an important role in bringing communities of specialists together. The American Educational Research Association (AERA) is one example of a much broader development. Well before the establishment of AERA, several disciplinary associations had already been founded, such as the American Philological Association (1869), the American Chemical Association (1876), the American Psychological Association (1892), and the American Sociological Association (1905). Other national or global learned societies emerged in more recent years, such as the Society for the History of Technology (1958) and the American Society for Environmental History (1977). With varying success, these associations have enabled regular interaction among their specialists—for example, within the frame of annual conferences or committee meetings. Many of them have also published their own specialized journals, handbooks, and book series. Seen in this light, we may ask how AERA has been able to promote and organize scientific communication to enhance and ensure the continuity of specialized scholarly communication about education.

AERA was originally known as the National Association of Directors of Educational Research (NADER). Membership in NADER was highly restricted. Institutional position was the primary criterion; active membership was reserved for directors of education research units and their immediate assistants (who were working primarily in city public schools). In light of the growing public interest in research and education, this policy changed shortly after World War I, when the association opened active membership to anyone who displayed the ability to conduct "research investigations and experimentations." As Mershon and Schlossman (2008) point out in their review of AERA's early history, "The criterion for inclusion became demonstrated competence as a researcher—and the primary indicator of that competence was written work . . . that the members of the policy-making Executive Committee could assess" (p. 319). The more inclusive name Educational Research Association of America, which was adopted in 1922, reflected this shift in membership policy. Under its new name, the association asserted the claim to represent the interests of all U.S. education researchers. This claim did not change 6 years later, when the association again changed its name, becoming AERA.

In the course of its history, AERA has launched several major scholarly journals. With support from the National Education Association (NEA), AERA established the *Review of Educational Research* (*RER*) in 1930. *RER* was AERA's only journal during the Great Depression years and in the period during and after World War II.

But in the 1960s and 1970s, AERA expanded rapidly. In 1964, the *American Educational Research Journal* (*AERJ*) appeared. *Educational Researcher* (*ER*), emanating from AERA's member newsletter, was first published in 1972. One year later, the first volume of the annual *Review of Research in Education* (*RRE*) appeared, and two additional specialized journals came out in the latter half of the 1970s: the *Journal of Educational and Behavioral Statistics* (*JEBS*; formerly *Journal of Educational Statistics*), in 1976, and *Educational Evaluation and Policy Analysis* (*EEPA*), in 1979. Most recently, in 2015, AERA launched *AERA Open*, an open-access online journal. In short, AERA's journals have been facilitating communication in an expanding field of research for about one century (see Levine & Hill, 2015). Analyses of the forms and formats of the communication processes in these journals may hence allow us to discern some basic characteristics of the evolution of the field of education research.[1]

In more general terms, we think of scientific communities as precariously constructed and historically contingent networks of specialists. They depend on social contexts that support the development of particular interests. They may also cease to exist when the communication among the specialists is discontinued (see Fisher, 1966; Lenoir, 1997). Or stated differently, these networks depend on regular communication among their members. Publication venues, such as scholarly periodicals, channel this communication process. They do not just enable the formation of networks of specialists or sustain communication during the intervals between annual conferences or meetings, they also allow separating a small body of legitimate scholarly work from other, "unscientific" enterprises. These journals, taken as a whole, control and steer the communication process among specialists (e.g., Abbott, 1999; Bazerman, 1988; Gross, Harmon, & Reidy, 2002; Stichweh, 1991, 1994). Exactly because of their significance for this communication process, we may also use the history of these journals to shed light on the "morphogenesis" of their specializations or disciplines.[2]

In this chapter, our focus is on the changing forms and formats of communication in the AERA journals. To avoid overburdening the reader, we pay particular attention to AERA's oldest journals, *RER* and *AERJ*; however, it is worth noting that the data we gathered for the other AERA journals confirmed our analyses based on these two. Using historical–sociological analyses of *RER* and *AERJ* for the period 1931 to 2014, we focus on three aspects of the communication process in the field of education. First, we consider the shifting conventions and expectations regarding authorship and editorship, as well as changing forms of authority and inclusion in authorial roles. Second, we consider the changing position of the AERA journals in the scientific world. Although AERA is a national organization, its journals are highly visible at the global level. We pay particular attention to changing forms of openness toward "our foreign friends" (*AERJ*, 1973, p. 175). Third, we examine the citation networks of the AERA journals. These networks consist of ties to other journals in the field of education and to journals in other fields, especially psychology and sociology. Analyses of the structure of these networks allow us to shed light on the degree of interdisciplinarity among the AERA journals and in the field of education research

overall. This in turn enables us to provide an outline of the morphology of the scientific community and to raise reflectivity about the social conditions that control education research.

The following analyses build on two types of material. On the one hand, we present a body of quantitative material on all the articles published in *RER* and *AERJ*. Because the coverage of the content of the older volumes of the AERA journals is often incomplete in the existing bibliographical databases, we composed our own data set, collected by examining each issue of the journals themselves. To calculate the citation networks of these journals, we relied on the "relatedness" data included in Web of Science.

On the other hand, we examined all editorial documents that appeared in AERA journals between 1931 and 2014. These documents frequently include reflections on the contemporary situation of education research in the United States; at times, they also offer thoughts on the history or the future of the field and/or its journals. We did not have access to the archives of the AERA journals, but we believe that the published editorial material from these journals will allow us to provide a thick description of the evolution of the forms and formats of scholarly communication in the field of education.

Participation in the community of American education researchers depends on a variety of often unarticulated rules and expectations. In this chapter, we try to show how the history of two of AERA's flagship journals sheds light on the ways in which communication among the members of this community has taken and takes place. It is therefore important to keep in mind that the forms and formats of communication affect the way research is conducted. In a kind of feedback loop, publications or publication possibilities exercise pressure on how research is imagined. We hope that our historical and sociological analyses of AERA's journals and of the field of education research will stimulate critical reflection on the directions in which education research and a number of adjacent academic specializations are currently developing.

EDITORS AND AUTHORS

In its first decades, *RER* was not what we would now call a "traditional" journal: It did not publish original research papers. Rather, it was conceived as a periodical reference work, regularly summarizing recent research on "the whole field" of education (*RER*, 1931, p. 2).[3] It was to appear five times per year, with each issue devoted to a specific topic. The editors presented a cycle of 15 topics to be addressed over a 3-year period; these topics related largely to contemporary challenges of schooling and school administration. *RER*'s first volumes dealt with topics such as the curriculum, teacher personnel, school organization, finance and business administration, tests of personality and character, tests of intelligence and aptitude, and school buildings, grounds, equipment, apparatus, and supplies. The last topic of the first cycle was "methods and technics of educational research."

For almost four decades, *RER* stayed close to its ambition to treat "the whole field" by means of a cyclical coverage of all important topics in education. Curriculum, for

example, was the topic of the first and 12 subsequent issues that appeared every 3 to 5 years until 1970 (see also *RER*, 1999, pp. 347–363). But *RER*'s topic cycle also changed over time—especially in response to the expansion and diversification of research interests in the field. Over the years, more emphasis was also put on research methods to help education researchers cope with a proliferation of quantitative and qualitative techniques (e.g., *RER*, 1939, p. 451; *RER*, 1956, pp. 323–343).

It is clear that *RER*'s original aim was to disseminate the results of scientific research to a broader audience: "to review earlier studies" and "to summarize the literature" for an audience of "teachers, administrators, and general students of education" (*RER*, 1931, p. 2). This editorial strategy was characterized by a hierarchical structure. An issue editor and a committee of experts were assigned for each issue to solicit and review all manuscripts, and often to author several review articles themselves. Authority and authorship were thus closely connected: Issue editors and authors were chosen because of their authority on the topics, but inclusion in *RER* also granted the issue editors and authors considerable authority. Interestingly, some authorship problems appeared. Authorship was not easily extended to a group of specialists. Several authors of *RER* articles were aided by "assistants." Sometimes authors published "in cooperation with" others—but those other contributors were not identified as full coauthors. In 1935 and 1936, moreover, errata had to be published to add coauthors to reviews that had appeared in print in previous issues. While this illustrates that the attribution of authorship could be contested (no other errata appeared in the early volumes), *RER* did, in the first decades of its existence, entrust only a few scholars with reviewing the relevant research. Or stated somewhat differently, *RER* entrusted and *authorized* only a few scholars to summarize and review what was considered to be the relevant research and hence to speak to the broader community of people interested in education and the results of education research.

Already, from the 1930s onward, questions and tensions emerged regarding the proper readership of *RER*. In 1938 and 1939, for example, the editorial board adopted five new topics to be covered in 3-year cycles. In an editorial foreword, it was underlined that the new organization would give due attention to instructional areas and therefore be of benefit to practitioners in schools rather than to researchers in universities: "The new subject matter issues do not fall so readily into the accustomed areas of specialization of university research workers," the editors wrote (*RER*, 1940, p. 75). As no scholars specialized in such instructional areas, these journal issues would be "much more difficult to prepare." But, the editors added, "It is hoped that they will render a larger service to a greater number of users and thus justify the increased effort that they call for" (p. 75). In the following decades, however, AERA increasingly oriented itself to the growing community of education researchers instead of to practitioners.

Beginning in 1970, *RER* adopted a different editorial policy in which each issue was expected to include unsolicited reviews on topics of the authors' choice. The incoming editor, Gene V. Glass, stated "the new editorial policy" as follows:

> The purpose of the *Review* has always been the publication of critical, integrative reviews of published education research. *In the opinion of the Editorial Board, this goal can now best be achieved by pursuing a policy of publishing unsolicited reviews of research on topics of the contributor's choosing.* . . . The reorganization of the *Review of Educational Research* is an acknowledgment of a need for an outlet for reviews of research that are initiated by individual researchers and shaped by the rapidly evolving interests of these scholars. (*RER*, 1970, p. 323)

The last issue that reflected the old editorial policy appeared in 1971.[4]

At that time, the landscape of scholarly publishing in the field of education had already changed. In 1964, AERA began publishing *AERJ*, with a mission to publish "original reports of experimental and theoretical studies in education." In the rapidly expanding field of scientific journals, *AERJ* was a "traditional" journal that put emphasis on the presentation of novel findings. Its establishment was an indication of the fact that AERA aspired to a more active, innovative role at the level of scholarly communication about education (see *AERJ*, 1966, pp. 211–221; *AERJ*, 1968, pp. 687–700). In 1967, AERA also became an autonomous organization of scholars and researchers, independent of NEA. In the same period of time, moreover, the *RER* editors put forward different expectations regarding the content and orientation of its articles. *RER* shifted its emphasis from summaries or reviews to critical evaluations; it now explicitly required its authors to provide an overview of the strengths and shortcomings of the existing knowledge base. Articles now had to advance research on the topics they discussed. Glass wrote, "It is hoped that the new editorial policy of the *Review*, with its implicit invitation to all scholars, will contribute to the improvement and growth of disciplined inquiry on education" (*RER*, 1970, p. 324). No doubt, these new expectations corresponded with changes in the composition of AERA's membership and *RER*'s readership base. In the 1960s and 1970s, this community was no longer a small world with a few leading scholars, who were in a position to survey the relevant research and disseminate its results to a broader audience of interested laypeople. In light of the professionalization of research, *RER*, rather, had to attract the attention of other researchers. Its readership came to consist mainly of specialists, who did not need a popularizing review to learn about developments in their field of research. The *raison d'être* of *RER*—as well as of *AERJ* and the other AERA journals that were established in the 1970s (i.e., *ER, RRE, JEBS*, and *EEPA*)—lay in the presentation of findings that were relevant primarily to the community of researchers. Seen in this light, the new editorial policy expressed by *RER* disqualified most of the journal's own early educational publications as either unoriginal or not properly scientific.

In the same editorial, Glass also indicated that "the role played by the *Review* in the past [would] be assumed by an *Annual Review of Research in Education*, which AERA [was] planning" (*RER*, 1970, p. 323). The first volume of the *RRE* appeared only 3 years later. *RRE* solicited reviews in particular research areas. In this regard, the "Statement From the Editor" accompanying the first issue of the *RRE* was reminiscent of the old editorial policy of *RER*: "The more important areas will appear periodically but not necessarily regularly. Some areas, relatively dormant or unproductive,

may not appear for years" (*RRE*, 1973, p. vii; see also *ER*, 1976, No. 11, p. 10). However, the *RRE* editor also took pains to underline that the new venue would orient itself toward a community of scholars, who would read it to inform themselves about ongoing education research. "Summaries of research studies are valuable and appropriate, but too much summary distracts from criticism and perspective" (*RRE*, 1973, p. vii). And he added, "Many conceive of reviewing as the summarizing of research studies and trends in order to inform readers and keep them abreast of their fields. Such an annotated bibliographic approach can have little impact, however" (*RRE*, 1973, p. vii).

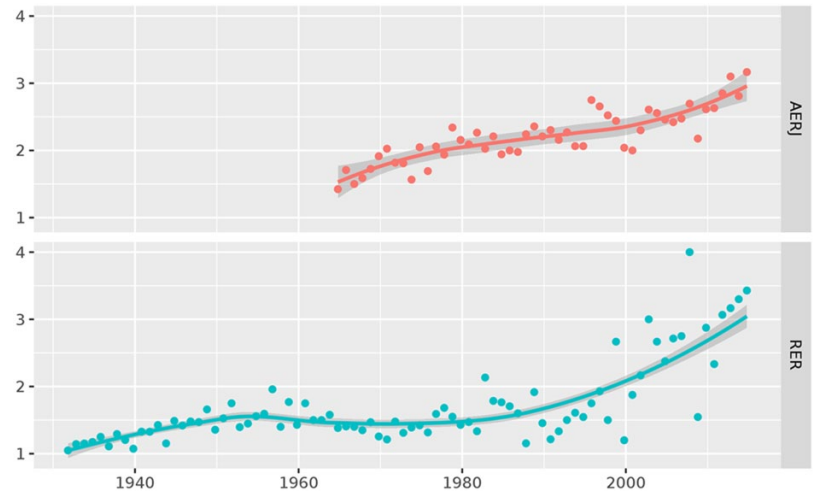
It is clear that *RRE*, like the other AERA journals in that period of rapid expansion of the field, was prompted to reflect on the impact it could have on the work of education researchers. Also illustrative in this regard is the first issue of *AERJ*, which published a critical review by Benjamin Bloom on what had been accomplished in education research during the past quarter of a century:

> Approximately 70,000 studies were listed in the *Review of Educational Research* over the past 25 years. Of these 70,000 studies, I regard about 70 as being crucial for all that follows. That is, about 1 out of 1,000 reported studies seem to me to be crucial and significant, approximately 3 studies per year. (*AERJ*, 1964, p. 218)[5]

While the forms and formats of communication changed, the overall publication output certainly did not decrease during this period. The expression "publish or perish," which became more widely used in the 1960s and 1970s, signaled the institutionalization of a "communication imperative" in science. Publications were now increasingly perceived as indices of full membership in the scientific community (see De Solla Price, 1963).

Against this background, it is interesting to point to a concomitant development at the level of the authorial roles. Figure 1 displays the evolution of the number of authors or coauthors per published article in *RER* and *AERJ*. It is clear that single-authored articles were the norm for a relatively long time. In 1931, all but two *RER* articles were single-authored (although "assistants" contributed to four of these articles). Forty years later, the majority of the articles in *RER* were still written by single authors. But the expectations and conventions quickly changed after that. In the case of *RER*, which adopted a new editorial policy in the 1970s, the average number of authors per article increased from 1.05 in 1931 to 1.21 in 1970 and 3.28 in 2014 (with a standard deviation of 1.45). In the case of *AERJ*, there was a relatively steady increase in the number of coauthored articles; the average changed from 1.42 in 1965 to 2.30 in 1990 and 3.22 in 2014 (with a standard deviation of 2.12). In 2014, only about one in six *RER* or *AERJ* articles were single-authored. Coauthored, if not multiple-authored, publications have now become the norm. For sure, research-intrinsic developments influenced this evolution—as empirical research is often carried out in teams. But the new communication formats also allow more researchers to participate in scholarly communication in education journals. This change may thus also be seen as a corollary of the expansion of the community of education researchers.

FIGURE 1
Yearly Average Number of Authors Per Article, 1931 to 2014



Not unimportantly, new forms of peer review (blind and double-blind) were introduced during this period. In a peer-review system, acceptance for publication in journals is to be governed by authors' scholarship, that is, manuscripts are to be evaluated impartially by referees—other scholars or peers—as acceptable for publication. Blind review was expected to replace the former system of invited submissions. In a number of fields, the introduction of the double-blind peer-review system has gone along with standardization (see Bazerman, 1988; Gross et al., 2002). Such standardization can also be observed in *RER* and *AERJ* in the 1970s. Shortly before the introduction of *RER*'s new editorial policy, for example, broad editorial guidelines were formulated: "There are no restrictions on the size of the manuscripts nor on the topics reviewed" (e.g., *RER*, 1969, inside cover). One decade later, much more detailed instructions were common in all AERA journals. Potential authors were referred to the publication manual of the American Psychological Association, which included detailed guidelines on manuscript structure and content, writing styles, and so forth. Manuscripts also needed to be accompanied by an abstract of 100 to 150 words. Page limitations were introduced. To enable blind review, the list of authors had to be typed on a separate sheet (e.g., *RER*, 1980, p. 201; *AERJ*, 1980, pp. 1, 125). As more emphasis was placed on individual scholarship, the community of education researchers increasingly defined and regulated the forms and formats of the communications or contributions that could be made.

No doubt, the new system required socialization processes on the part of editors, reviewers, and authors. In a somewhat unconventional "Message From the Editors," written shortly after the introduction of the peer-review system, the *AERJ* editors

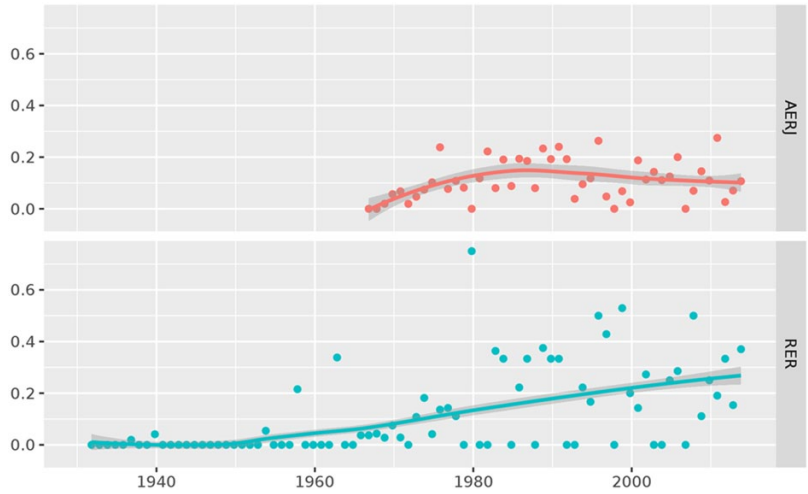
stressed the decisive role of the assessments of the various reviewers and tried to respond to "some irate colleagues" (*AERJ*, 1973, p. 176). The editors of the AERA journals, they stated, do "*not* meet or work as a group, even though all are doing what they can to contribute to the production of fine, worthwhile publications. They certainly do *not* 'conspire' for or against any authors, subjects, or types of study" (p. 176). Moreover, "frequent phone calls or letters to the editorial office do *not* facilitate the review process. Once a manuscript has been sent out to consultants, editors do not have any further information until the reviews and recommendations are back" (p. 176). Moreover, "the editors are *not* monsters with sinister motives, out to get this author or insult that scholar . . . [They make mistakes but] they are not so bad as to justify unbridled invectives and tirades on the part of some of our fellow educational researchers" (p. 177). As is clear in this editorial statement, the distribution of authority had to be renegotiated in the expanding field of education research. The "gatekeepers" had difficulty communicating the norms and conventions of this field of research. The development of the discipline required discipline of all its members.[6]

Such historical developments are not unique to the field of education research. Similar trends have been observed in other disciplinary specializations and other scientific communities. In fields such as physics, biology, mathematics, and information sciences, scholarly articles written by only one author have become highly exceptional. At the same time, it can be argued that these trends are quite pronounced in the field of education research (see Vanderstraeten, 2011). Building on Michel Foucault (1995), we might even speak of the "disappearance" and "effacement" of the author. It has become increasingly difficult to identify the "real" author or originator of a particular publication. As a consequence of the institutionalization of a broad range of norms and conventions that bear on publications, the "subjectivity" of the author tends to get lost in the process of scholarly communication.[7] Perhaps it is one of the contradictions of postmodern society that publication in scholarly journals has become *more* important for purposes of evaluating individual researchers and research groups.

NATIONAL AND GLOBAL AUDIENCES

Another central aspect of the development of scholarly journals and associations is their position in the social and scientific worlds. Although AERA was founded as a national organization, it has become a leader at the global level. It counts more than 25,000 members, with a good number outside the United States. Its journals are highly visible at the global level, if one takes, for example, the Thomson Reuters Web of Science impact factor as a proxy of global visibility.[8] In the 2014 index, *RER* ranked first in the Education and Educational Research category, which consisted of 224 peer-reviewed journals from around the world. The other AERA journals also ended up relatively high in this index: *ER* was ranked 9th; *AERJ*, *RRE*, *EEPA*, and *JEBS* were 13th, 22nd, 25th, and 50th, respectively. In this section, we present analyses of the ways that "the rest of the world" has been represented in AERA's two

FIGURE 2
Yearly Proportion of Authors With Non-U.S. Affiliations, 1931 to 2014



flagship journals in the course of the last century. We also point to the core position of American associations and journals, such as AERA and its journals, in the contemporary world of science.

Figure 2 presents a historical overview from 1931 to 2014 of the geographical locations of the researchers who actively contributed to scholarly communication in *RER* and *AERJ*. This figure displays, more particularly, data on the institutional affiliations of the first authors of all the articles published in these journals through 2014. For *RER*, the data again clearly show the difference between the old and new editorial policies. The first contribution *not* written by a U.S. author appeared in 1934, in the first issue devoted to the topic of "history of education and comparative education." In 1939, the next issue devoted to that topic included two contributions not written by U.S. authors. In 1957 and 1962, *RER* published two other issues on "education in countries other than the USA," in which its editors invited a relatively large number of "foreigners" to comment on the state of, and the main challenges for, the educational systems in their home countries. As long as the editors solicited chapters from individual authors, however, they largely relied on scholars from the United States. They invited non-U.S. scholars to write only on topics on which their authority was undisputed. As shown by the AERA membership lists published yearly in *RER*, the association and its journal were long directed primarily to people working in the U.S. context (see also *RER*, 1956, p. 208).

But the field of education research was a clear beneficiary of the expansion of the American system of higher education in the 1950s and 1960s. Benjamin Bloom, in his presidential address presented at the AERA Annual Meeting in 1966, provided a

short overview of this rapid expansion. "From the level of support of 1960," Bloom estimated, the growth in federal funding of education research and development had been "of the order of 2,000 per cent" (*AERJ*, 1966, p. 211). In the United States, the number of education researchers increased substantially during that period; Bloom noted that in the previous 5 years, membership in AERA had grown "at the rate of about 25 per cent per year" (*AERJ*, 1966, p. 213). The growing number of journals devoted to education was another factor in (and indicator of) the expansion and "academization" of the scholarly community. If the 1960s constituted a Renaissance in education research, the expansion and ensuing professionalization of research also drove the amateurs out of the community (*ER*, 1982, No. 9, pp. 7, 10). Due to the growth of the scholarly community, researchers could direct their communications to other researchers instead of to "those off campus" (see *AERJ*, 1973, pp. 173–177; *RER*, 1999, pp. 384–396).

In this period, the AERA journals also made some attempts to further an orientation toward the world of education research. In 1964, the editorial board of *RER* invited assistance from a substantial group of "international contributing editors" (27 in total). However, without any explanation, the international board disappeared 5 years later (under Glass's editorship). In 1973, the new editors of *AERJ* published a message to specify their aims or missions: "These missions may be somewhat novel to the *AERJ* and our efforts may cause a little confusion in some quarters" (*AERJ*, 1973, p. 173). They listed three aims: covering the entire field of education research, introducing peer review for all submitted articles, and broadening the perspective "from the United States to the whole world," thus diminishing the "provincialism" of American education researchers (p. 175). The last aim was also expressed in more general terms by the *AERJ* editors:

> We feel the urgent need to open our vista to what the rest of the world has to teach us. . . . Sooner or later, we hope that the AERA will recognize the necessity of such a broadened perspective and spearhead an effort for establishment of something like a World Congress of Educational Research. (*AERJ*, 1973, p. 175)

The data presented in Figure 2 make clear that the globalization of the AERA journals took off during this period. The geographical location of the authors widened.[9] In the case of *AERJ*, the share of articles written by "our foreign friends" increased from 2.0% in 1968 to 10.7% in 2013. In the case of *RER*, this share increased from 2.8% in 1968 to 37.0% in 2013. As Figure 2 shows, however, the fluctuations from year to year and the variations between the journals were relatively large, indicating the instability of the underlying trend. (It should not come as a surprise that globalization of authorship was more pronounced in the case of *RER*, which did not have a national index and attempted to cover the entire field of education research. *AERJ*, by contrast, explicitly presented itself as an American journal.)

From the late 1970s onward, one finds echoes of these broader aims. A new journal, *Issues in Education*, which was sponsored by members of Divisions A (Administration), F (History and Historiography), and G (Social Context of

Education), and which had the explicit aim of broadening the publication program of AERA, was published in 1983. However, only three volumes of the journal appeared. Confronted with the consequences of the economic and fiscal crisis of the 1970s, AERA choose not to sponsor *Issues* as a separate association journal.[10] Instead, the association decided to create two sections within *AERJ*, one focusing on "Studies of Teaching and Learning" and one focusing on "Social and Institutional Analysis of Education." The second section was presented as the successor of *Issues*. In the first introduction to the Social and Institutional Analysis of Education section, the editor presented a quite pessimistic historical summary. Looking back at what had been published in *AERJ* in the 1970s and 1980s, he concluded that "the contents of *AERJ* . . . seem, on the whole, similar to what was published before the attempt to change the journal [in 1973]" (*AERJ*, 1990, p. 4). A few exceptions were granted—but just as a relatively narrow thematic orientation was said to prevail (one on work that "conformed to the dictates of psychological science"), it was stated that "the international emphasis . . . [has] gradually faded from the pages of *AERJ*" (pp. 2, 4). As Figure 2 shows, however, the proportion of authors with non-U.S. affiliations increased gradually through the late 1980s. Perhaps the pessimistic historical summary had to support the case of the new *AERJ* section.[11]

But what currently motivates non-U.S. scholars to contribute to the journals and meetings of the AERA? Why do AERA and its journals no longer have to invest much effort to be attractive to educational specialists from "the rest of the world"? Although we cannot present data about the participation of American education researchers in non-American associations and journals, it is clear that the globalization of the field of education research has taken place in uneven and asymmetrical ways. The core position of several AERA journals within the world of education research is supported by the instruments that are used to measure "impact" or visibility within scientific communication processes. In quite a number of other countries, the journal rankings and impact factors of Web of Science have become important elements in evaluation assessments. That policy orientation prompts researchers from those countries to submit their work to top-ranked journals, such as *RER, AERJ*, and some other AERA journals. Seen in this light, the American education research arena has, in recent decades, become more globalized because of changing norms and structural pressures in other parts of the scholarly world.

We may conclude that, over the past few decades, AERA has become both a national and a global association of education research specialists. Like few other national associations of scholars specialized in education, it is able to regulate communication in national and global networks. Not many other national associations or journals of education attract participants or potential authors from so many parts of the world. Paradoxically, the increase in contributions by non-U.S. scholars is an indication of U.S. dominance in the world of education research. In the current World of Science, the rankings and impact factors have put AERA and its journals, when taken together, in a central and dominant position.

Globalization has taken other forms, too. For example, professional associations and journals with a regional focus have expanded rapidly in recent years—among them several European associations and journals (e.g., the *European Journal of Education*, the *European Journal of Teacher Education*, and *Higher Education in Europe*). Interestingly, however, AERA's format has been imitated in Europe. To enhance communication among European scholars, the European Educational Research Association was founded in 1994; its main journal, the *European Educational Research Journal*, was first published in 2002. Such isomorphic processes are another clear indication of AERA's leading position and that of its journals in the contemporary world of education research.[12] Current forms of globalization go hand-in-hand with increased stratification among journals and other media in scientific communication.

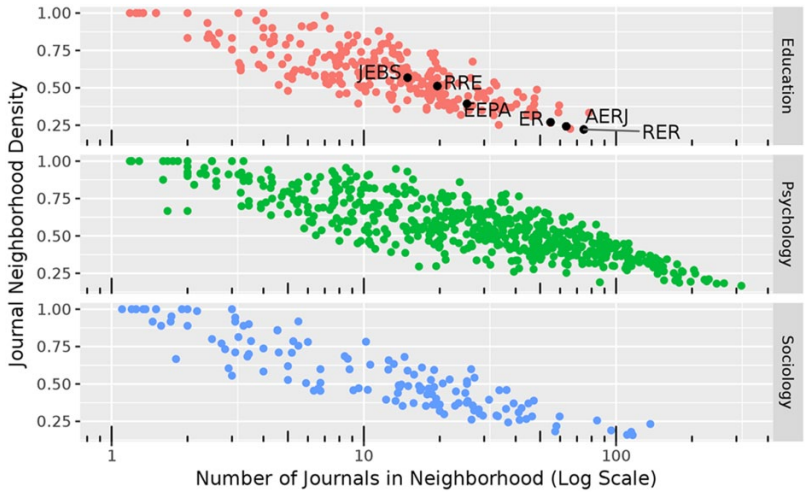
CITATION NETWORKS

In the preceding sections, we have looked at changing forms of authority and changing structures in the world of educational science.[13] In this section, we pay further attention to how *RER* and *AERJ* position themselves within the worldwide Web of Science. We complement the foregoing historical analyses with analyses of the relevant citation environment of these two AERA journals. As we have seen, *RER* originally aimed at disseminating research findings to an American audience of educational practitioners and policymakers (see *RER*, 1931, p. 2). But the expansion of the system of higher education in general, and of the field of education research in particular, has changed the forms and structures of communication in the field. Scholarly publications have become embedded within networks of related scholarly publications. All published work is expected to interact with preceding work, by incorporating arguments developed in other publications; at the same time, however, new publications are expected to lay claim to new knowledge, to invite responses, and thereby advance research. Interestingly, some of the changed expectations were already discussed in an early reflective *AERJ* article, which looked critically at the first *AERJ* issues:

> As an instrument of communication, a journal is a *receiver* of information to the extent that its articles cite articles published in other journals; it is a source of information to the extent that its articles are cited as bibliographical references in other journals. Assuming that a journal should serve more than an archival function, the latter is the more important index of a journal's impact. (*AERJ*, 1968, p. 694)

There are a number of ways to sketch the networks within which the AERA journals participate. To provide some context, Figure 3 first looks at some network characteristics of all journals in the fields of education, psychology, and sociology that are included in Web of Science. More particularly, Figure 3 visually represents the relation between the density of their networks and the total number of journals in their one-step neighborhoods from 2003 to 2013. A network's density is the

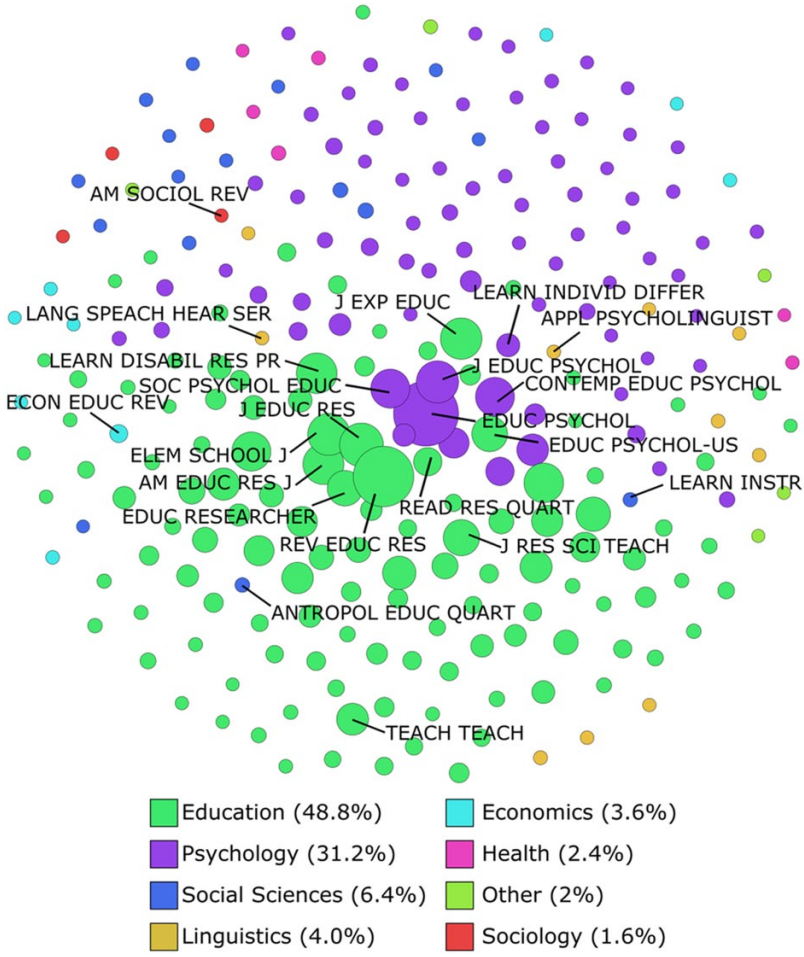
FIGURE 3
Average Citation Neighborhood Density and Size of Education, Sociology, and Psychology Journals, 2003 to 2013



number of ties in the network, expressed as a proportion of the number possible. Not surprisingly, network density is highly correlated with the absolute number of journals in the network: Densities are lower in large networks than in small ones. The number of ties that a journal has to others does not keep pace with the number of other journals available. In this regard, the divergences between the disciplinary specializations represented in Figure 3 are small. To identify the AERA journals, we used black dots.[14] In comparison with other journals, both *RER* and *AERJ* are well connected with other Web of Science journals in terms of their absolute number of ties, while their network density is not particularly distinctive. In comparison with other education journals, they have a very large number of journals in their one-step neighborhood. Their position vis-à-vis other journals might be seen to reflect their generalist nature: Both journals succeed in bringing a wide variety of research to the fore. (It should not come as a surprise that specialist journals, such as *JEBS* and *EEPA*, have fewer peers. *RRE* can also be seen as a specialist journal, as each annual issue is devoted to a particular theme.)

In addition, Figures 4 and 5 portray the citation environments of *RER* and *AERJ*. These networks are based on the relatedness data from the Social Sciences Edition of the Journal Citation Reports (JCR, which is part of the Thomson Reuters Web of Science). Compared with density, the relatedness factor allows for more detailed analyses of citation networks. Relatedness data are calculated by means of an algorithm proposed by Pudovkin and Garfield (2002). They express the relationship (R) between two journals (x and y) as follows:

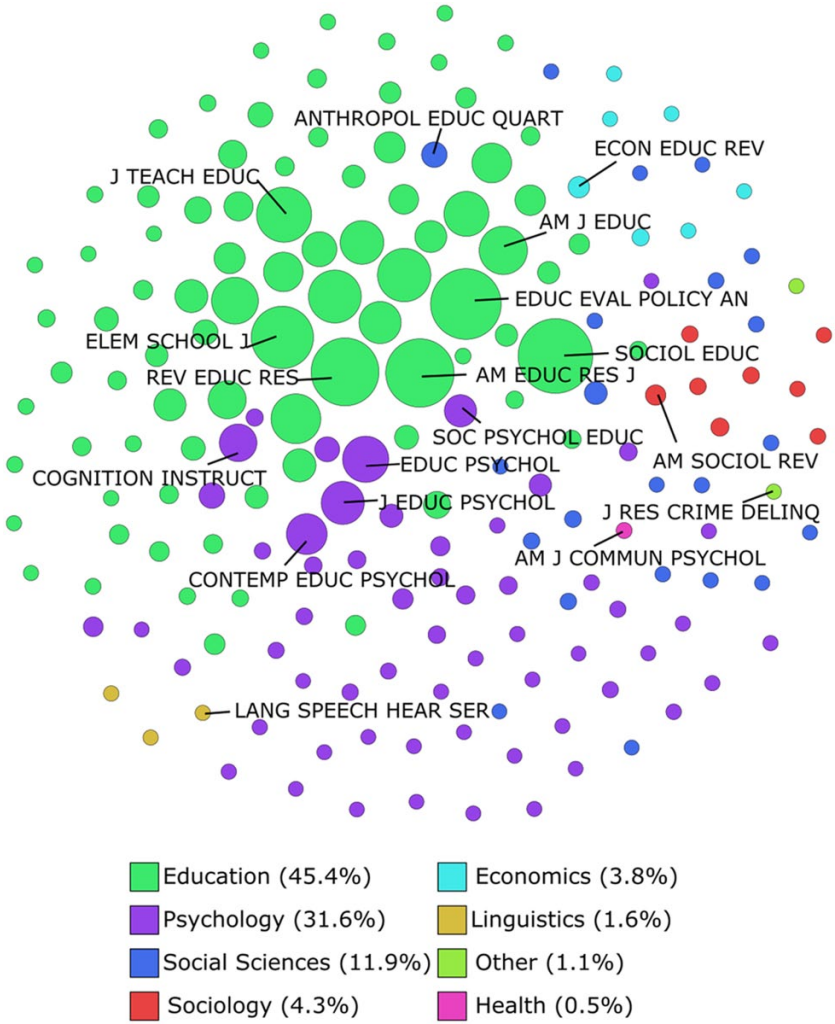
FIGURE 4
Journal Citation Environment of the *Review of Educational Research*, 2003 to 2013



$$R_{(x>y)} = C_{(x>y)} * 10^6 / (P_y * Rf_x),$$

where $C_{x>y}$ refers to the number of citations from the citing journal *x* to the cited journal *y*, P_y refers to the total number of papers published in journal *y*, and Rf_x refers to the number of references cited in journal *x*. We collected the relatedness scores for *RER* and *AERJ*, as well as the relatedness scores for all the other journals in their respective environments. We also collected these data in two directions: We

FIGURE 5
Journal Citation Environment of the *American Educational Research Journal*, 2003–2013



worked with cited data (i.e., in-degrees or citations) and citing data (i.e., out-degrees or references). In addition, to take random fluctuations into account, we calculated the average relatedness scores for the entire period for which the JCR data are currently available, that is, the period 2003 to 2013. Based on previous experience, we feel safe in arguing that this method allows for a detailed sketch of the relevant

citation networks of *RER* and *AERJ* (Vandermoere & Vanderstraeten, 2012; Vanderstraeten & Vandermoere, 2015).[15] In Figures 4 and 5, for purposes of clarity in a limited space, we use the Web of Science abbreviations of journal titles.

As can be seen in the results presented in Figures 3 to 5, the AERA journals are connected with a broad range of other Web of Science journals. We might add, moreover, that both *AERJ* and *RER* systematically have larger incoming scores (at the citation level) than outgoing scores (at the reference level). Specifically, in 82% of the cases for *AERJ* and in 93% of the cases for *RER*, the in-degree is larger than the out-degree. Stated differently, *RER* and *AERJ* are more frequently cited in the other journals than the other journals are cited in *RER* and *AERJ*. This confirms the prestigious and central positions that the two journals occupy in the field of education research, to which we referred earlier.

To bring some order into these chaotic network structures, we have grouped the journals in categories. For each of the journals linked to *AERJ* and *RER*, we more particularly looked at their JCR subject categories (see the appendix). By using these categories, we obtained an overview of the broader, disciplinary and interdisciplinary environments of both core journals (see Silva, Rodrigues, Oliveira, & Costa, 2013). *AERJ* and *RER* are linked to 31 and 36 subject categories, respectively. To some degree, the colors used in Figures 4 and 5 reflect this diversity.[16] Not surprisingly, other journals in the subject category "Education and Educational Research" are highly interrelated with both *RER* and *AERJ*. But the two AERA journals are also strongly linked with journals in the categories "Educational Psychology" and "Developmental Psychology." Other psychological subcategories include "Experimental Psychology," "Social Psychology," and "Applied Psychology." After psychology, *AERJ* and *RER* are linked mainly with journals in sociology, followed by journals in economics and linguistics. Other common subject categories are "Special Education," "Rehabilitation," and "Family Studies." Overall, the categorized data presented in the appendix confirm the network data in Figures 4 and 5. The citation networks of *AERJ* and *RER* are broad and far reaching. They include journals not only in the adjacent disciplines and subdisciplines but also in other interdisciplinary categories, such as "Social Issues," "Urban Studies," and "Interdisciplinary Social Sciences." Viewing the field in this light, we can concur with a recent observation by the sociologist Jerry Jacobs: "The field of education should be absolved from the charge of intellectual remoteness" (Jacobs, 2013, p. 119; see also Graff, 2015).

The interdisciplinary communication networks in which both *RER* and *AERJ* are situated comprise two pairs of major subdisciplinary specializations: (a) psychology and educational psychology and (b) sociology and sociology of education. But in their relationships with these other specializations, *AERJ* and *RER* distinguish themselves from one another: While the input of studies in sociology seems to be stronger in the case of *AERJ*, the input of studies in psychology is stronger in the case of *RER*. The same holds true, but to a lesser extent, at the level of the subdisciplines. Although educational psychology and sociology of education are strongly connected to both *AERJ* and *RER*, the sociological specialization in education connects more strongly

with *AERJ*, and the psychological specialization connects more strongly with *RER*. In the AERA journals, the dependence of education research and AERA on psychology and statistical methodology has been criticized on more than one occasion (e.g., *RER*, 1956, pp. 205–209; *AERJ*, 1966, pp. 223–229; *AERJ*, 1974, pp. 41–49; *AERJ*, 1990, pp. 1–8; *RER*, 1999, pp. 384–396; *RER*, 1999, pp. 397–405). As mentioned before, in 1990 *AERJ* was split into two sections—"Social and Institutional Analysis" and "Teaching, Learning, and Human Development"—in order to complement the journal's traditional focus on teachers and students. Our analyses suggest that *AERJ* strengthened the interdisciplinary orientation of the community of education researchers. But the question remains whether the "newly integrated *AERJ*" will be able to give ample attention to the social and historical aspects of education.

In the labyrinth of journals, one can also detect other differences. Journals in the field of educational psychology clearly outnumber those focusing on educational sociology or the sociology of education. Accordingly, a separate subject category, "Educational Psychology," has been added to the JCR of Web of Science. No such category exists for Sociology of Education. The few journals that explicitly mention this orientation in their titles (such as *Sociology of Education*) most strongly connect with generalist education research journals (such as *AERJ*) or generalist sociology journals (such as the *American Sociological Review*). In contrast, journals in the field of educational psychology (such as *Educational Psychologist*) most strongly connect with *RER* or with other journals specializing in educational psychology (e.g., *Contemporary Educational Psychology*, *Journal of Educational Psychology*, *Educational Psychology Review*). Thus, there seems to be a difference in the extent to which educational psychologists and educational sociologists relate to their respective specializations and disciplines. Not coincidentally, the label "educational sociology" is much less used than "sociology of education." Educational psychologists, it seems, now identify first of all with scholars who share an interest in educational psychology. Educational sociologists, on the other hand, might identify first and foremost with the discipline of sociology.

Over the years, education researchers have often reinterpreted psychological and sociological paradigms in terms amenable to their own research interests. From a sociological point of view, it might be added that the importance that education researchers attach to psychology (and, to a lesser extent, sociology) is linked to their position in an academic setting where psychology (and sociology) is often perceived to be the more prestigious disciplines. The low level of connection with journals in other fields of study, such as history and philosophy, not only reflects some biases of the JCR of Web of Science but, in our view, is also a result of the declining reputation of those fields of study within science overall.

With the growth of the scientific community, more specialized subdisciplinary affiliations also acquired greater weight. In the second half of the 1970s, at the end of a period of rapid expansion, AERA established more specialized journals such as *JEBS* and *EEPA*, hence contributing to trends toward increasing differentiation. It seems fair to say, however, that affiliations at the disciplinary level have not

disappeared. Journals such as *RER* and *AERJ* publish research that is, in principle, directed toward the whole community of education researchers. Through the editorial policies of its generalist journals, AERA provides and upholds an orientation that is both more general than the subdisciplinary specializations and more specific than much of the research that is borrowed from other disciplines, such as psychology and sociology. In such policies, the association may, moreover, bring other considerations to bear, such as practical relevance for teachers, school administrators, or decision makers. Intangibles, such as the nature or identity of the discipline, are conditioned by these complex networks.

CONCLUSION

Many specialized scientific communities emerged and expanded in the course of the 19th and 20th centuries. Important opportunity structures for such collective efforts were provided by the expanding universities, which offered a widening range of career possibilities. Specialized journals also became the main vehicle for the scholarly claims of research specialists. They became media of scholarly publication par excellence. In addition, the scientometric instruments that have been developed in recent decades have strengthened the relevance of journals in ongoing scientific communication processes. The web of science, as it is now commonly depicted, consists mainly of publications in scholarly journals.

Education research was a clear beneficiary of the rapid postwar expansion of the university system, especially in the United States. The growth of the number of scholars interested in education has been reflected in the growth of the number of specialized journals. During the second half of the 20th century, there have emerged a substantial number of other cognate scholarly journals and learned societies. On the foregoing pages, we have also seen that the more decentralized communication structures, which AERA adopted in the postwar decades, allowed for the active participation of a larger community of specialists. At the same time, however, the journals developed regulatory norms and mechanisms, which disciplined the members of the entire scholarly community (see also *RER*, 1999, p. 399). The figures presented on the foregoing pages indicate how the AERA journals *RER* and *AERJ* organized communication around education in the period between 1931 and 2014. In particular, we have focused on some interrelated aspects: the structures of authority and authorship, the national versus global orientation of these journals, and the features of their citation networks. While there are differences in scale between *RER* and *AERJ*, the evolutions that we were able to discern in the forms and formats of communication are consistent for both journals. The longitudinal data that we gathered for all other AERA journals point in the same directions.

In the course of the past two centuries, scientific publication has become an imperative, interfering in every research process. During the last few decades, researchers have also become subject to structural pressures that call for regular or frequent publications. The institutionalization of the publication imperative ("publish or perish")

even discredits research that has not yet led to this kind of scholarly output. As long as no results are published, it is even difficult—both institutionally and psychologically—to close particular research projects. Researchers gain the freedom to do something else, to move to new research projects, only after they have been able to communicate the results of previous commitments to their peers by means of publications. Seen from this perspective, the changing forms and formats of scholarly communication in the AERA journals also shed light on the evolution of the expectations regarding how education research is to be conducted.

APPENDIX

To offer a better overview of the citation environments of *RER* and *AERJ*, these tables present the JCR subject categories in which the journals linked to *RER* and *AERJ* are grouped by Web of Science. The tables include the number of journals in each subject category and the relative weight (in a percentage) of each subject category in the citation environment of *RER* and *AERJ*.

Journals Linked to *RER:* Web of Science Subject Categories for 2014

JCR Subject Category	Number of Journals	Percentage
Education & Educational Research	107	30.57
Psychology, Educational	40	11.43
Psychology, Developmental	24	6.86
Education, Special	18	5.14
Psychology, Experimental	17	4.86
Psychology, Multidisciplinary	16	4.57
Linguistics	12	3.43
Rehabilitation	13	3.71
Psychology, Applied	11	3.14
Psychology, Social	9	2.57
Social Sciences, Interdisciplinary	9	2.57
Sociology	9	2.57
Management	8	2.29
Economics	6	1.71
Family Studies	5	1.43
Psychology, Clinical	5	1.43
Psychology, Mathematical	5	1.43
Public, Environmental & Occupational Health	5	1.43
Information Science & Library Science	4	1.14
Social Work	4	1.14
Ergonomics	2	0.57
Ethnic Studies	2	0.57

(continued)

APPENDIX (CONTINUED)

JCR Subject Category	Number of Journals	Percentage
Hospitality, Leisure, Sport & Tourism	2	0.57
Nursing	2	0.57
Social Issues	2	0.57
Social Sciences, Mathematical Methods	2	0.57
Urban Studies	2	0.57
Business	1	0.29
Communication	1	0.29
Health Policy & Services	1	0.29
Industrial Relations & Labor	1	0.29
Law	1	0.29
Psychiatry	1	0.29
Public Administration	1	0.29
Women's Studies	1	0.29
Anthropology	1	0.29
Total	350	100.00

Journals Linked to *AERJ*: Web of Science Subject Categories for 2014

JCR Subject Category	Number of Journals	Percentage
Education & Educational Research	78	30.47
Psychology, Educational	35	13.67
Psychology, Developmental	20	7.81
Sociology	13	5.08
Psychology, Multidisciplinary	12	4.69
Psychology, Experimental	8	3.13
Psychology, Social	8	3.13
Social Sciences, Interdisciplinary	8	3.13
Economics	7	2.73
Education, Special	7	2.73
Psychology, Applied	7	2.73
Rehabilitation	7	2.73
Family Studies	6	2.34
Linguistics	6	2.34
Psychology, Mathematical	5	1.95
Social Sciences, Mathematical Methods	4	1.56
Ethnic Studies	3	1.17
Urban Studies	3	1.17
Criminology & Penology	2	0.78
Demography	2	0.78

(continued)

APPENDIX (CONTINUED)

JCR Subject Category	Number of Journals	Percentage
Political Science	2	0.78
Public Administration	2	0.78
Social Issues	2	0.78
Social Work	2	0.78
Health Policy & Services	1	0.39
Industrial Relations & Labor	1	0.39
Management	1	0.39
Psychiatry	1	0.39
Psychology, Clinical	1	0.39
Public, Environmental & Occupational Health	1	0.39
Women's Studies	1	0.39
Total	256	100.00

NOTES

[1]AERA also invested in other types of publications (see *ER*, 1976, No. 11, pp. 9–13). It sponsored the *Encyclopedia of Educational Research*, which first appeared in 1941, and collaborated with Phi Delta Kappa to publish a dictionary of educational terms (the first edition appeared in 1945). In more recent years, AERA has sponsored book series and book publications on a more systematic basis, as listed on the AERA website under Publications. Here, we deal only with the AERA journals. Because we use these journals as source materials, we cite them by referring to the journal, publication year, and page numbers.

[2]The National Society for the Study of Education (NSSE; originally the National Society for the Scientific Study of Education) is commonly perceived to be the oldest association devoted to education research in the United States; its first yearbook appeared in 1902 (Tyack & Hansot, 1982). But the NSSE was dissolved in 2008, shortly after it had celebrated its centenary. In our reading, some of the persistent crises in the NSSE resulted from the fact that it was unable to develop the tools (such as periodicals) to bring a community of specialists together on a regular and continuous basis.

[3]NADER sustained itself through a quarterly internal newsletter, the *Educational Research Bulletin.* Educational Research Association of America's main publication was the *Journal of Educational Research* (*JER*), which carried a mixture of articles, editorial commentaries, and news items. *JER* kept a distance from the world of science; it intended to "emphasize applications rather than abstractions, and practice rather than theory. . . . Research for the sake of research we shall leave for others" (*JER*, 1920, p. 1). In the late 1920s, conflicts with the publisher over the ownership of *JER* severely weakened AERA. With support from the NEA, AERA could again strengthen its organization and create a new journal: *RER* (see Mershon & Schlossman, 2008, pp. 326–327).

[4]By 1970, the limitations of the old editorial policy had already been discussed in various editorials. Since the 1970s, the policy of publishing unsolicited manuscripts has not changed substantially. Occasionally, *RER* still publishes solicited reviews of particular issues, studies, or books (see also *RER*, 1972, p. i). Over the past decades, however, only two issues have been entirely devoted to a special topic.

[5]A few years later, as a reaction to perceived information overload, which resulted from the expansion of the field, the Education Resources Information Center (ERIC) was established. After almost half a century, the ERIC database includes indexing for over 1,000 journals.

[6]Of course, it can also be argued that the complaints of the "irate colleagues" were indicative of the tensions that surrounded the rise of less hierarchical, less centralized structures in the expanding field of education research.

[7]As we will see in the final empirical section of this chapter, the increasing use of references to other literature (citations) is also an indication of the depersonalization of science. Texts build on the authority of other texts—texts that have also gone through the double-blind peer-review system.

[8]Of course, it should be taken into account that Web of Science originated in the United States. Although in recent years attempts have been made to include more non-Anglo-Saxon journals and to provide better coverage of the global scientific communication system, Web of Science is clearly biased in favor of the Anglo-Saxon world. We are aware of the limitations of its database, but it is also worth underlining that the widespread use of this database is indicative of the hegemony of Anglo-Saxon journals and Anglo-Saxon research.

[9]Fred Kerlinger was affiliated with the University of Amsterdam when the first issue of *RRE* appeared under his editorship (1973).

[10]Another AERA journal founded in the 1980s, *Contemporary Education Review*, was also discontinued after a few years.

[11]In recent years, the *AERJ* editors also called for perspectives that would "blend the methods and foci of the two sections of *AERJ*" (*AERJ*, 2012, p. 6). Thus, it is no surprise that a "newly integrated *AERJ*" has appeared—no longer divided into two sections with distinct programs and concerns.

[12]Another isomorphic initiative is the World Education Research Association, which was founded in 2009 by a number of education research associations from around the world "to transcend what any one association can accomplish in its own country, region, or area of specialization" (*ER*, 2009, p. 388; see also *ER*, 2009, pp. 650–651). For a discussion of the growing international scope of education research, see Levine and Hill (2015). For a discussion of the relevance of national and international audiences for processes of scientific specialization, see Vanderstraeten and Vandermoere (2015).

[13]Of course, our approach has been selective. We have dealt with a few aspects of the forms of inclusion in these communication processes but left out several others. Our database does not yet allow us to comment on aspects related to social background, race, or gender characteristics of the authors represented in the AERA journals. We hope that more encompassing analyses of forms of inclusion and exclusion will soon follow.

[14]We calculated yearly averages for the period 2003 to 2013 to smooth out short-term fluctuations and highlight longer term trends. Journals attributed by Web of Science to more than one subject field (such as education and psychology) appear only once in Figure 3; we used only the subject field they are first attributed to. Journals for which this attribution changed over time are classified according to the last available classification.

[15]It should be kept in mind that this database includes only part of the scientific literature: Articles in journals included in Web of Science. But we should not overlook the fact that publications in high-ranked periodicals have become the canonical form of scientific communication in a wide variety of disciplinary specializations, including education research (see Gross et al., 2002).

[16]However, a journal may belong to more than one subject category. The total number for the subject categories is higher than the total number of journals in the network. In our figures, we depart from the journals, not from the subject categories. For reasons of clarity, we have also focused at the disciplinary level, thereby amalgamating different Web of Science categories for subdisciplinary specializations.

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